

IN THE SPECIFICATION:

Please make the following amendments in the Abstract. A replacement Abstract is submitted on a separate sheet.

~~The present invention relates to a~~ A catalytic cellulignin fuel obtained by a biomass pre-hydrolysis process and that is composed of cellulose and globulized lignin with a specific surface of about $1.5 - 2.5 \text{ m}^2/\text{g}$. The cellulignin fuel ~~according to the invention~~ may be ground down to particles smaller than $250\mu\text{m}$ and has a combustion heat value that can reach up to 18 - 20 MJ/kg and an ignition time equal to or shorter than 20 ms (0.02s).

Please make the following amendments in the Specification.

Please amend the first full paragraph on page 3, beginning at line 13 as follows:

The theoretical specific area for the cell is of about $0.7\text{m}^2/\text{g}$, of about $50\text{m}^2/\text{g}$ for the macrofibrillae, of about $200\text{m}^2/\text{g}$ for the microfibrillae, of about $900\text{m}^2/\text{g}$ for the miscealla, and of about $1300\text{m}^2/\text{g}$ for the molecules.

Please amend the third full paragraph on page 11, beginning at line 6 as follows:

~~Figures 3a - 3e show microphotographs of the structure of a cellulignin according to the present invention, while Figure 4 graphically shows difratograms of X-rays for wood, cellulose and cellulignin.~~

Figure 3a shows a microphotograph of the structure of a cellulignin according to the present invention (with an increase of 1000 times).

Figure 3b shows a microphotograph of the structure of a cellulignin according to the present invention (with an increase of 10,000 times).

Figure 3c shows a microphotographs of the structure of a cellulignin according to the present invention (with an increase of 50,000 times).

Figure 3d shows a microphotograph of the structure of a cellulignin according to the present invention (with an increase of 100,000 times).

Figure 3e shows the microstructure of the cellulignin with globlized lignin according to the present invention (370nm).

Figure 3f shows the microstructure of the cellulignin with globlized lignin according to the present invention (133nm).

Figure 3g shows the microstructure of the cellulignin with globlized lignin according to the present invention (333nm).

Figure 3h shows the microstructure of the cellulignin with globlized lignin according to the present invention (33nm).

Figure 4a graphically shows a difratogram of an X-ray for wood and cellulose (Core).

Figure 4b graphically shows a difratogram of an X-ray for wood and cellulose (Abrumum).

Figure 4c graphically shows a difratogram of an X-ray for wood and cellulose (Cellulose).

Figure 4d graphically shows a difratogram of an X-ray for cellulignin hydrolyzed in woodshaving.

Figure 4e graphically shows a difratogram of an X-ray for cellulignin ground in knif mill.

Figure 4f graphically shows a difratogram of an X-ray for cellulignin ground in ball mill.

Please amend the fifth full paragraph on page 11, beginning at line 13 as follows:

Figures 8 - 12b illustrate systems and equipment useful for the combustion of the cellulignin fuel now defined. Figure 8 illustrates a Catalytic Cellulignin feeding system. Figure 9 illustrates a helical feeder. Figure 10 illustrates a rotary valve. Figure 11 illustrates an axial combustor. Figure 12a illustrates a horizontal combustor. Figure 12b illustrates a vertical combustor.

Please amend the first full paragraph on page 12 beginning at line 6 as follows:

Again referring to figure 1 and Table 1 presented above, one can see that according to the processes of hydrolysis of biomass the cellulose fibers release is not complete, because the hemicellulose has its highest concentration in the second layer (S2) of its secondary wall. With the pre-hydrolysis process developed by the present inventors, it now has been achieved a product with a specific surface of about ~~1.5 - 2.52/g~~ 1.5 - 2.5 m²/g, with an average value of ~~2m²/g~~ 2 m²/g, measured by BET (Brunace, Emmett and Teller) and a slush number 100, this meaning that this pre-hydrolysis process reaches the level where partial release of the macrofibrille occurs.

Please amend the paragraph bridging page 13 and 14 beginning at line 30 on page 13 as follows:

6 - Table 4a illustrates the physical characteristics of the Micropores (Active Sites) and table 4b presents the distribution of the Meso and Macropores. The former was determined by BET - Adsorption of N₂ and the latter was determined by Hg porosimetry. The total specific area

measured by BET is about $2.20\text{m}^2/\text{g}$, and the specific area of the macro and meso pores were the larger portion of the total area. The calculation thereof from the average radius of the pore measured by Hg porosimetry results in $1.80\text{m}^2/\text{g}$, admitting a cylindrical symmetry of the pore ($I = 2r$). This conclusion is coherent with the low micropores volume ($1.1 \times 10^{-3}\text{cm}^3/\text{g}$) measured by BET. The distribution of the macro and meso pores has its maximum value ranging from 1 to $5\mu\text{m}$ (1000 - 5000nm), this size coinciding with the voids of the cells photographed by MEV (figures 3a, 3b, and 3e). The data of table 4 and the microstructures of MEV permit the complete characterization of the catalytic cellulignin fuel according to the present invention. The micropores are measured by the iodine number equal to 100; in the case of the catalytic cellulignin still there is no instrumentation that enables one to appraise the of the micropores (2nm) contribution in the combustion.

IN THE DRAWINGS:

Figures 3e and 4 have been amended as shown in the Replacement Drawings.